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ELECTRONICS INDUSTRIES, LTD.**

MATSUYAMA DIVISION  
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Page 1 of 19 pages

# **TEST REPORT**

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REPORT NUMBER : MKM98F-006

APPLICANT : Matsushita-Kotobuki  
Electronics Industries, Ltd.

MODEL NUMBER : CW-7503-B

FCC ID : IUO9TB074CRB

Regulation : FCC Part15B Class B

Conducted Emission Test  
Radiated Emission Test

Matsushita-Kotobuki Electronics Ind., Ltd.  
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TABLE OF CONTENTS

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|                                                    | Page |
|----------------------------------------------------|------|
| SECTION 1. <u>TEST CERTIFICATION</u> .....         | 3    |
| SECTION 2. <u>EQUIPMENT UNDER TEST</u> .....       | 5    |
| SECTION 3. <u>SUPPORT EQUIPMENT USED</u> .....     | 6    |
| SECTION 4. <u>CABLE(S) USED</u> .....              | 7    |
| SECTION 5. <u>CONSTRUCTION OF EQUIPMENT</u> .....  | 9    |
| SECTION 6. <u>OPERATING CONDITIONS</u> .....       | 10   |
| SECTION 7. <u>TEST PROCEDURE(S)</u> .....          | 11   |
| SECTION 8. <u>EVALUATION OF TEST RESULTS</u> ..... | 12   |
| SECTION 9. <u>PHOTOGRAPHS OF TEST SET-UP</u> ..... | 16   |
| SECTION 10. <u>INSTRUMENTS USED FOR TEST</u> ..... | 18   |
| SECTION 11. <u>PRECISION</u> .....                 | 19   |
| SECTION 12. <u>VALIDITY OF TEST REPORT</u> .....   | 19   |

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SECTION 1. TEST CERTIFICATION

## APPLICANT INFORMATION

Company : Matsushita-Kotobuki Electronics Industries, Ltd.  
Address : 8-1, Furujin-machi, Takamatsu-city, Kagawa-ken,  
760-0025 Japan

## GRANTEE INFORMATION

Company : Matsushita-Kotobuki Electronics Industries, Ltd.  
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Contact person : Kenji Matsugi

## DESCRIPTION OF TEST ITEM

Kind of equipment : CD-R Drive  
Trademark : Matsushita-Kotobuki  
FCC ID : IUO9TB074CRB  
Model number : CW-7503-B  
Serial number : 8X28XXA00012

## TEST PERFORMED

|                 |   |                                                 |
|-----------------|---|-------------------------------------------------|
| FCC File No.    | : | 31040/SIT                                       |
| Test started    | : | November 20, 1998                               |
| Test completed  | : | November 20, 1998                               |
| Purpose of test | : | FCC Docket 87-389                               |
| Regulation      | : | FCC Part 15B Class B<br>Unintentional Radiators |
| Test setup      | : | ANSI C63.4 -1992                                |

Report file number : MKM98F-006

Report issue date : November 20, 1998

Test engineer : Shinji Yamauchi S. Yamauchi

Report approved by : Shigeru Suzuki S. Suzuki  
[ Manager ]

This equipment complies with above standard or regulation under the test condition or test configuration shown on this test report.

## SECTION 2. EQUIPMENT UNDER TEST

The equipment under test (E.U.T.) consists of the following equipment.  
Indication in the following left side column corresponds to section 5.

| Symbol | Item       | Model No. | Serial No.   | FCC ID       | Manufacturer                               |
|--------|------------|-----------|--------------|--------------|--------------------------------------------|
| A)     | CD-R Drive | CW-7503-B | 8X28XXA00012 | IUO9TB074CRB | Matsushita-Kotobuki Electronics Ind., Ltd. |

Power ratings of E.U.T : +5V DC, 2.0A / +12V DC, 2.0A

### 2.1 Port(s) / Connector(s) :

SCSI Bus Connector(50pin), Head Phone Jack(Stereo Mini Plug),  
Audio Out Connector(4pin), DC IN Connector(4pin)

### 2.2 Oscillator(s) / Crystal(s) :

| Oscillator     | Operating Frequency | Board name | Remarks                                      |
|----------------|---------------------|------------|----------------------------------------------|
| 33.8688 MHz    | 33.8688 MHz         | Main PCB   | MN662753                                     |
| 17.2872 MHz    | 17.2872 MHz         | Main PCB   | LC895926                                     |
| 20 MHz         | 20 MHz              | Main PCB   | LC895926                                     |
| 320.0 MHz/typ. |                     | Pick Up    | High Frequency Module<br>(Highest Frequency) |

### SECTION 3. SUPPORT EQUIPMENT USED

The E.U.T. has been supported by the following equipment during these tests. Indication in the following left side column corresponds to section 5.

| Symbol | Item                              | Model No.                      | Serial No.   | FCC ID       | Manufacturer        |
|--------|-----------------------------------|--------------------------------|--------------|--------------|---------------------|
| B)     | Interface Card                    | AHA-1542CF                     | BC0F5091092  | FGT1542CF    | Adaptec             |
| C)     | Audio Interface Card              | LMEP0266A                      | None         | IUO9TB014CRI | Matsushita-Kotobuki |
| D)     | Host Computer                     | DESK PRO 2000<br>M5166/2500/CD | 7714HVU40014 | CNT75MDEBV5  | COMPAQ              |
| E)     | Head Phone                        | RP-HT28                        | None         | N.A.         | Panasonic           |
| F)     | CD-ROM Drive                      | CR-503-S                       | SA3514004298 | IUO9TB013CRS | Matsushita-Kotobuki |
| G)     | Stereo Radio<br>Cassette Recorder | RX-F5                          | None         | ACJ9TBRX-F5  | Panasonic           |
| H)     | Keyboard                          | Enhanced II<br>Keyboard        | 9101421CB515 | CNT47K109232 | COMPAQ              |
| I)     | Color Display                     | CM1483MU                       | Y0J005103    | ABL9679001CD | HITACHI             |
| J)     | Printer                           | 3630A                          | 3219A17397   | BSD8533630A  | HEWLETT<br>PACKARD  |
| K)     | Modem                             | C202A                          | 010489       | BKM552C202A  | EPSON               |

SECTION 4. CABLE(S) USED

The following cable(s) was used for testing. Indication number in the following left side column corresponds to section 5.

| Number | Name                      | Length | Shield | From                                 | To                                |
|--------|---------------------------|--------|--------|--------------------------------------|-----------------------------------|
| 1)     | 50Pin Flat cable          | 0.4 m  | None   | CD-ROM Drive(A)<br>Plastic connector | Interface Card                    |
| 2)     | Audio cable               | 0.4 m  | None   | CD-ROM Drive(A)<br>Plastic connector | Audio Interface<br>Card           |
| 3)     | DC Power cable            | 0.4 m  | None   | CD-ROM Drive(A)                      | Host Computer                     |
| 4)     | Head Phone cable          | 1.5 m  | None   | CD-ROM Drive(A)<br>Plastic connector | Head Phone                        |
| 5)     | SCSI I/F cable            | 1.2 m  | Yes    | Interface Card<br>Metal connector    | CD-ROM Drive(F)                   |
| 6)     | Audio cable               | 1.0 m  | None   | Audio Interface Card                 | Stereo Radio<br>Cassette Recorder |
| 7)     | Audio cable               | 1.0 m  | None   | Audio Interface Card                 | Stereo Radio<br>Cassette Recorder |
| 8)     | Keyboard I/F cable        | 1.4 m  | Yes    | Host Computer<br>Metal connector     | Keyboard                          |
| 9)     | Video Signal<br>I/F cable | 1.7 m  | Yes    | Host Computer<br>Metal connector     | Color Display                     |

None :

All cables are not attached ferrite core.

The following cable(s) was used for testing. Indication number in the following left side column corresponds to section 5.

| Number | Name                                             | Length | Shield | From                              | To           |
|--------|--------------------------------------------------|--------|--------|-----------------------------------|--------------|
| 10)    | Parallel I/F cable                               | 1.5 m  | Yes    | Host Computer<br>Metal connector  | Printer      |
| 11)    | RS-232C I/F cable                                | 1.1 m  | Yes    | Host Computer<br>Metal connector  | Modem        |
| 12)    | Power cord for<br>Host Computer                  | 2.0 m  | Yes    | Host Computer                     | Power Source |
| 13)    | Power cord for<br>CD-ROM Drive(F)                | 2.0 m  | Yes    | CD-ROM Drive(F)                   | Power Source |
| 14)    | Power cord for Stereo<br>Radio Cassette Recorder | 1.9 m  | None   | Stereo Radio<br>Cassette Recorder | Power Source |
| 15)    | Power cord for<br>Color Display                  | 1.8 m  | None   | Color Display                     | Power Source |
| 16)    | Power cord for Printer                           | 2.0 m  | None   | Printer                           | AC Adapter   |
| 17)    | Power cord for Printer                           | 2.0 m  | None   | AC Adapter                        | Power Source |
| 18)    | Power cord for Modem                             | 1.9 m  | None   | Modem                             | Power Source |

None :

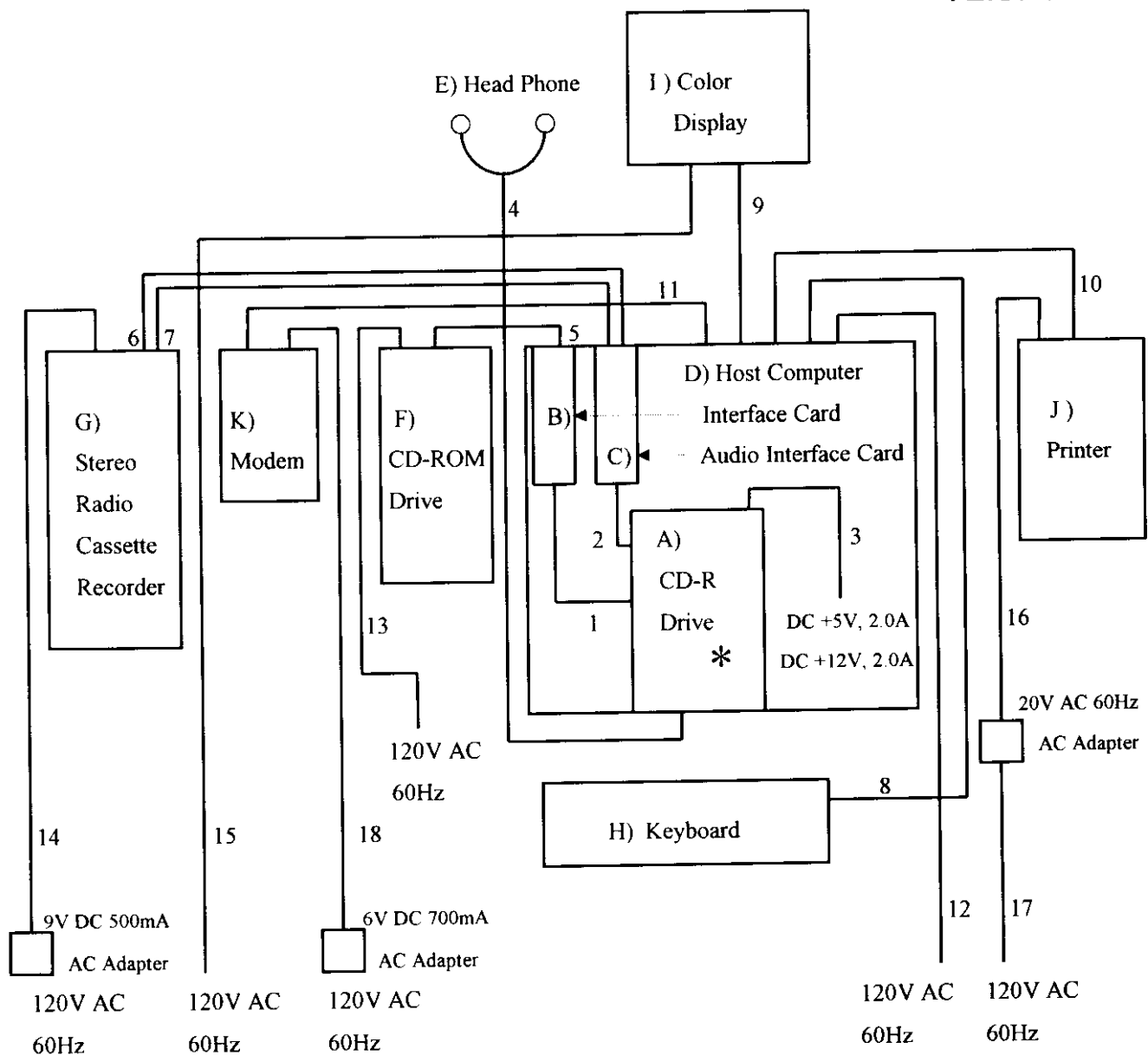
All cables are not attached ferrite core.

## SECTION 5. CONSTRUCTION OF EQUIPMENT

The construction of E.U.T. during testing is as follows.

### System configuration

\*: E.U.T.



Symbol or numbers assigned to equipment or cables on this diagram are corresponded to the symbols or numbers assigned to equipment or cables on tables in Sections 2 to 4.

## SECTION 6. OPERATING CONDITIONS

The E.U.T. has been operated under the following conditions during the tests.

### 6.1 Operating condition

The tests have been carried out under Read mode.

### 6.2 Operation flow

Performed following operations continuously.

1. The E.U.T. operates the normal speed.
2. The E.U.T. play-backs the audio data.
3. The E.U.T. reads the 'H' characters' data.
4. The Color Display displays 'H' characters.
5. The Printer prints 'H' characters' data.
6. The Modem sends 'H' characters' data.
7. The CD-ROM Drive(F) reads 'H' changes' data.
8. The E.U.T. changes the disc rotating speed to the maximum speed.
9. The E.U.T. reads 'H' characters' data.
10. The Color Display displays 'H' characters.
11. The Printer prints 'H' characters.
12. The Modem sends 'H' characters' data.
13. The CD-ROM Drive(F) reads 'H' characters' data.

**SECTION 7. TEST PROCEDURE(S)**

Tests have been carried out with the test procedure(s) drawn up by our laboratory which is in accordance with the following test procedure(s).

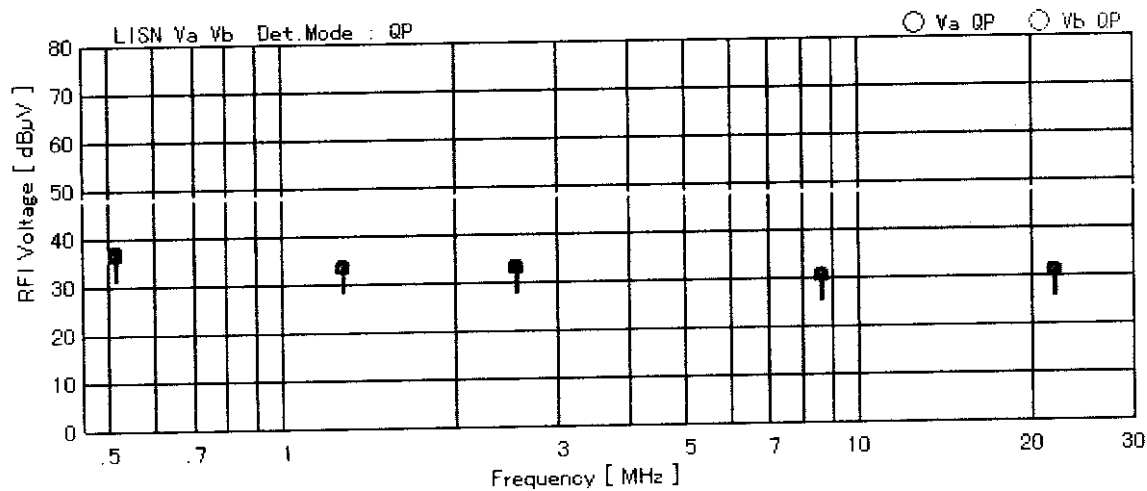
| Test item          | Test procedure used | Scanned Frequency Range |
|--------------------|---------------------|-------------------------|
| Conducted Emission | ANSI C63.4-1992     | 0.45 - 30 MHz           |
| Radiated Emission  | ANSI C63.4-1992     | 30 - 2000 MHz           |

## SECTION 8. EVALUATION OF TEST RESULTS

### 8.1 Conducted Emission Test

|                |                      |
|----------------|----------------------|
| Model Name     | CD-R Drive           |
| Model No.      | CW-7503-B            |
| Serial No.     | 8X28XXA00012         |
| Power Supply   | 120V / 60Hz          |
| Test Mode      | READ                 |
| Temp/Humi/Pres | 19°C / 54% / 1003hPa |
| Operator       | S.Yamauchi           |

| No | Freq.<br>[MHz] | Reading Level |              | Factor<br>[dB] | Emission Level |              | Limit<br>[dBuV] | Margin<br>[dB] |
|----|----------------|---------------|--------------|----------------|----------------|--------------|-----------------|----------------|
|    |                | Va<br>[dBuV]  | Vb<br>[dBuV] |                | Va<br>[dBuV]   | Vb<br>[dBuV] |                 |                |
| 1  | 0.517          | ---           | 36.6         | 0.1            | ---            | 36.7         | 48.0            | 11.3           |
| 2  | 0.517          | 36.2          | ---          | 0.1            | 36.3           | ---          | 48.0            | 11.7           |
| 3  | 1.278          | ---           | 33.1         | 0.2            | ---            | 33.3         | 48.0            | 14.7           |
| 4  | 2.560          | 32.8          | ---          | 0.2            | 33.0           | ---          | 48.0            | 15.0           |
| 5  | 8.655          | ---           | 29.9         | 0.4            | ---            | 30.3         | 48.0            | 17.7           |
| 6  | 22.031         | 29.7          | ---          | 1.1            | 30.8           | ---          | 48.0            | 17.2           |



## 8.2 Radiated Emission Test

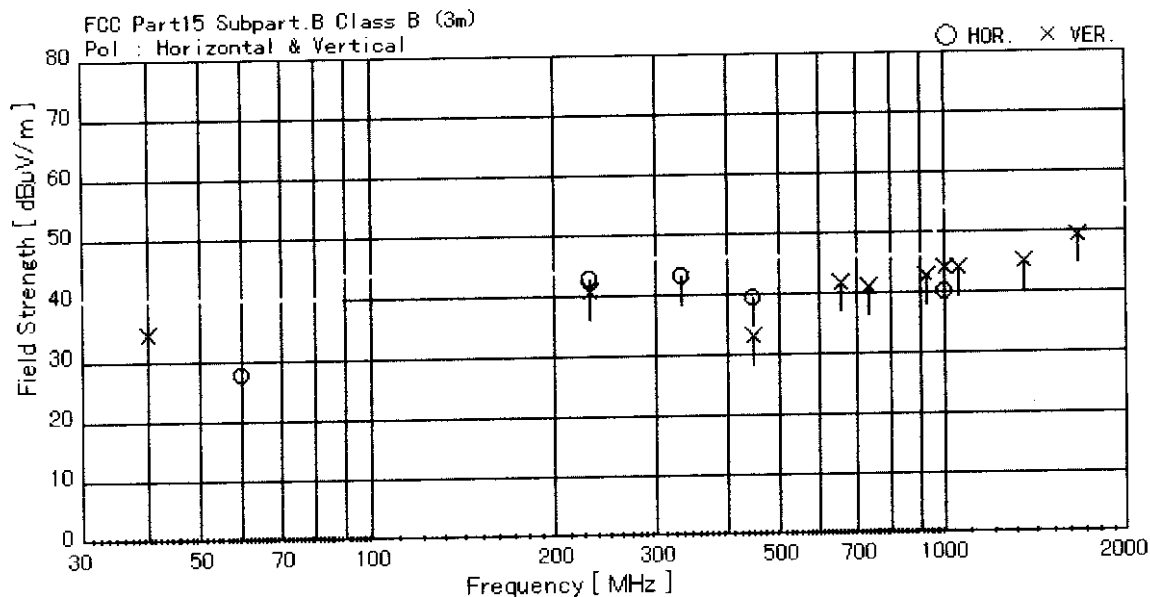
|                |                      |
|----------------|----------------------|
| Model Name     | CD-R Drive           |
| Model No.      | CW-7503-B            |
| Serial No.     | 8X28XXA00012         |
| Power Supply   | 120V / 60Hz          |
| Test Mode      | READ                 |
| Temp/Humi/Pres | 19°C / 54% / 1003hPa |
| Operator       | S.Yamauchi           |

[ Quasi Peak Mode ]

| No. | FREQ<br>[MHz] | READING LEVEL  |                | FACTOR<br>[dB] | EMISSION LEVEL   |                  | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] |
|-----|---------------|----------------|----------------|----------------|------------------|------------------|-------------------|----------------|
|     |               | HOR.<br>[dBuV] | VER.<br>[dBuV] |                | HOR.<br>[dBuV/m] | VER.<br>[dBuV/m] |                   |                |
| 1   | 40.005        | ----           | 17.4           | 16.9           | ----             | 34.3             | 40.0              | 5.7            |
| 2   | 59.994        | 17.7           | ----           | 10.0           | 27.7             | ----             | 40.0              | 12.3           |
| 3   | 232.526       | 23.9           | ----           | 18.9           | 42.8             | ----             | 46.0              | 3.2            |
| 4   | 232.526       | ----           | 22.0           | 18.9           | ----             | 40.9             | 46.0              | 5.1            |
| 5   | 334.545       | 23.5           | ----           | 19.4           | 42.9             | ----             | 46.0              | 3.1            |
| 6   | 449.486       | ----           | 11.8           | 21.2           | ----             | 33.0             | 46.0              | 13.0           |
| 7   | 449.490       | 18.2           | ----           | 21.2           | 39.4             | ----             | 46.0              | 6.6            |
| 8   | 664.341       | ----           | 15.5           | 26.2           | ----             | 41.7             | 46.0              | 4.3            |
| 9   | 730.801       | ----           | 14.3           | 26.6           | ----             | 40.9             | 46.0              | 5.1            |
| 10  | 930.112       | ----           | 13.8           | 28.8           | ----             | 42.6             | 46.0              | 3.4            |
| 11  | 996.518       | ----           | 15.2           | 28.9           | ----             | 44.1             | 54.0              | 9.9            |
| 12  | 996.558       | 11.2           | ----           | 28.9           | 40.1             | ----             | 54.0              | 13.9           |

[ Peak Mode ]

| No. | FREQ<br>[MHz] | READING LEVEL  |                | FACTOR<br>[dB] | EMISSION LEVEL   |                  | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] |
|-----|---------------|----------------|----------------|----------------|------------------|------------------|-------------------|----------------|
|     |               | HOR.<br>[dBuV] | VER.<br>[dBuV] |                | HOR.<br>[dBuV/m] | VER.<br>[dBuV/m] |                   |                |
| 1   | 1065          | ----           | 15.3           | 28.7           | ----             | 44.0             | 54.0              | 10.0           |
| 2   | 1330          | ----           | 15.4           | 30.0           | ----             | 45.4             | 54.0              | 8.6            |
| 3   | 1660          | ----           | 17.3           | 31.8           | ----             | 49.1             | 54.0              | 4.9            |



### 8.3 Conclusion

This test report clearly shows that the EUT is in compliance with the FCC Part 15B, Class B specification.

The minimum margins to the limits are as follows:

|                         |         |    |             |
|-------------------------|---------|----|-------------|
| -Conduction measurement | 11.3 dB | at | 0.517 MHz   |
| -Radiation measurement  | 3.1 dB  | at | 334.545 MHz |

## 8.4 Sample Calculations

### 8.4.1 Conducted Emission

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Example @ 0.517 MHz

$$\begin{array}{rcl}
 \text{Emission Level} & = & \text{Meter Reading} \quad 36.6 \text{ dBuV} \\
 & + & \text{A.M.N. Factor} \quad + \quad 0.1 \text{ dB} \\
 & & \hline
 & = & 36.7 \text{ dBuV}
 \end{array}$$

$$\begin{array}{rcl}
 \text{Margin} & = & \text{Limit} \quad 48.0 \text{ dBuV} \\
 & - & \text{Emission Level} \quad - \quad 36.7 \text{ dBuV} \\
 & & \hline
 & = & 11.3 \text{ dB}
 \end{array}$$


---

A.M.N. : Artificial Mains Network = Line Impedance Stabilization Network (LISN)

### 8.4.2 Radiated Emission

---

Example @ 334.545 MHz

$$\begin{array}{rcl}
 \text{Emission Level} & = & \text{Meter Reading} \quad 23.5 \text{ dBuV} \\
 & + & \text{Factor} \quad + \quad 19.4 \text{ dB} \\
 (\text{Factor} = \text{Antenna Factor} + \text{Cable Loss}) & & \hline
 & = & 42.9 \text{ dBuV/m}
 \end{array}$$

$$\begin{array}{rcl}
 \text{Margin} & = & \text{Limit} \quad 46.0 \text{ dBuV/m} \\
 & - & \text{Emission Level} \quad - \quad 42.9 \text{ dBuV/m} \\
 & & \hline
 & = & 3.1 \text{ dB}
 \end{array}$$


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SECTION 10. INSTRUMENTS USED FOR TEST

| Instrument                                   | Model No. | Serial No. | Manufacturer    | Last cal. | Period |
|----------------------------------------------|-----------|------------|-----------------|-----------|--------|
| EMI Test Receiver                            | 85462A    | 3520A00241 | Hewlett Packard | 11/98     | 1 Year |
| RF Filter Section                            | 85460A    | 3448A00210 | Hewlett Packard | 11/98     | 1 Year |
| Biconical Antenna                            | BBA9106   | None       | Schwarzbeck     | 4/98      | 1 Year |
| Logperiodic Antenna                          | UHALP9107 | 1623       | Schwarzbeck     | 4/98      | 1 Year |
| Double Ridged Antenna                        | 3115      | 9702-5139  | EMCO            | 7/98      | 1 Year |
| Artificial Mains Network(AMN)                |           |            |                 |           |        |
| = Line Impedance Stabilization Network(LISN) |           |            |                 |           |        |
|                                              | ESH3-Z5   | 840062/024 | Schwarzbeck     | 6/98      | 1 Year |
| Artificial Mains Network(AMN)                |           |            |                 |           |        |
| = Line Impedance Stabilization Network(LISN) |           |            |                 |           |        |
|                                              | ESH3-Z5   | 840062/028 | Schwarzbeck     | 7/98      | 1 Year |

## SECTION 11. PRECISION

Tolerance of the measuring instruments are shown on below.

- |                                              |                      |
|----------------------------------------------|----------------------|
| 1. Antenna factor                            | $\pm 2.0$ dB         |
| 2. Cable loss                                | $\pm 1.0$ dB         |
| 3. EMI test receiver                         | $\pm 2.0$ dB         |
| 4. Artificial Mains Network(AMN)             | impedance $\pm 20\%$ |
| = Line Impedance Stabilization Network(LISN) |                      |
| 5. Site Attenuation                          | $\pm 4.0$ dB         |

Repeatability and reproducibility about maximum emission setup are not specified herein.

## SECTION 12. VALIDITY TEST REPORT

- 12.1 The test result of this report is effective for equipment under test itself and under the test configuration described on the report.
- 12.2 This test report does not assure that whether the test result taken in other testing laboratory is compatible or reproducible to the test result on this report or not.
- 12.3 Copying of this report without permission is prohibited.